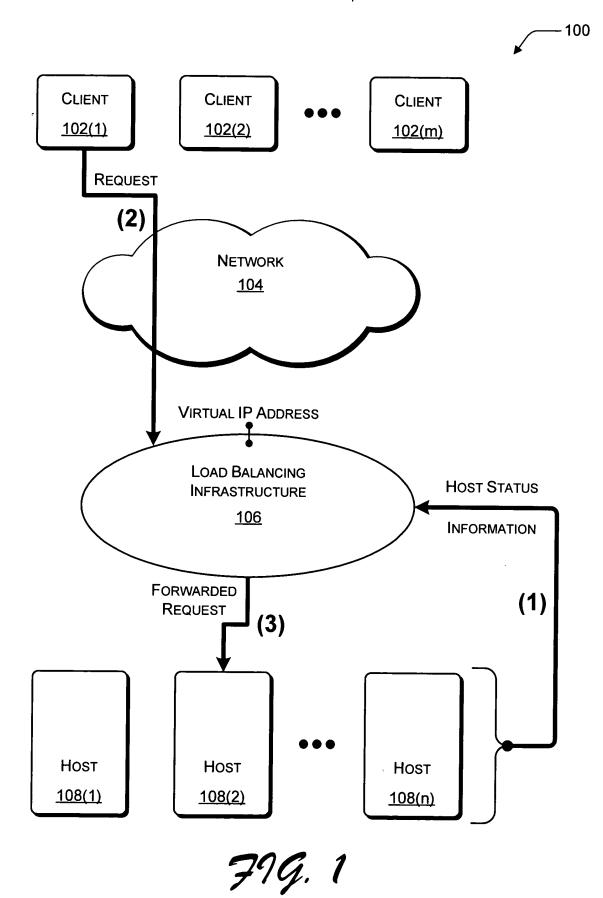
Docket No: MS1-1517US 1 of 40 Inventor(s): Gbadegesin et al. Title: Network Load Balancing

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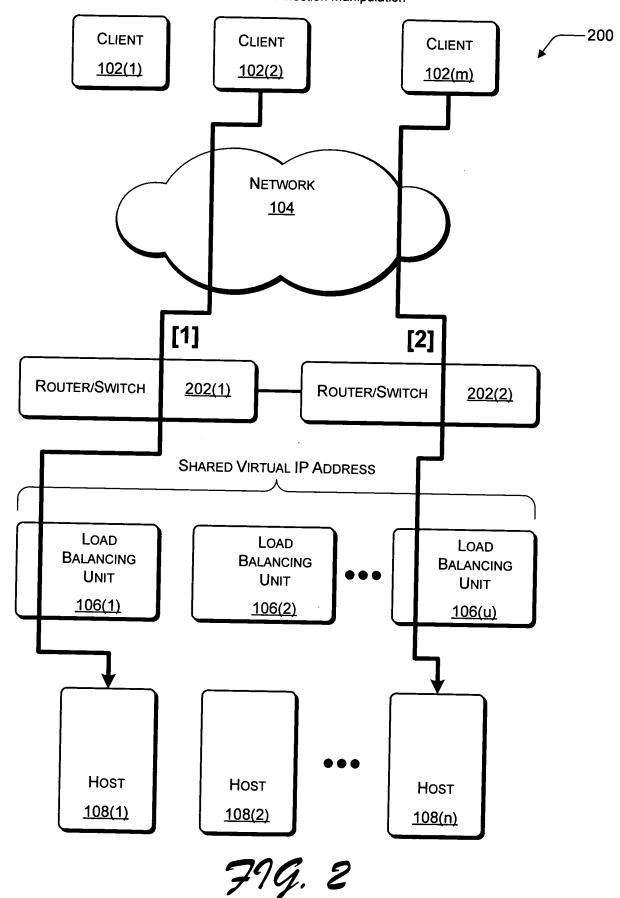
with Connection Manipulation



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Inventor(s): Gbadegesin et al.

Title: Network Load Balancing
with Connection Manipulation



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Inventor(s): Gbadegesin et al.

Title: Network Load Balancing
with Connection Manipulation

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FORWARDER  CLASSIFIER  302  304	REQUEST ROUTER 306
Session Tracker	308
CONNECTION MIGRATOR	310
TUNNELER	<u>312</u>
HEALTH AND LOAD HANDLER	<u>314</u>
Load Balancing Unit 106	

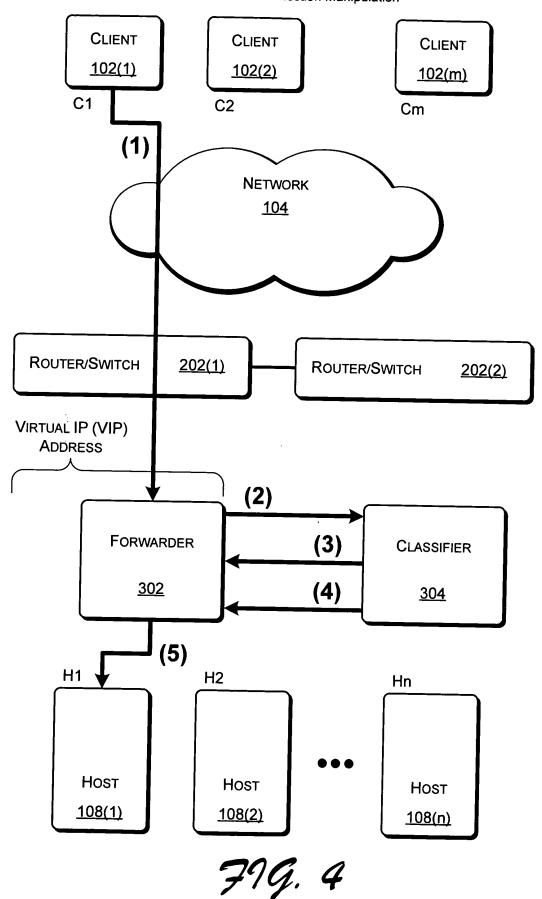
 APPLICATION(S)
 316

 Host
 108

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Inventor(s): Gbadegesin et al.

Title: Network Load Balancing
with Connection Manipulation



Docket No: MS1-1517US 5 of 40

Inventor(s): Gbadegesin et al. Title: Network Load Balancing

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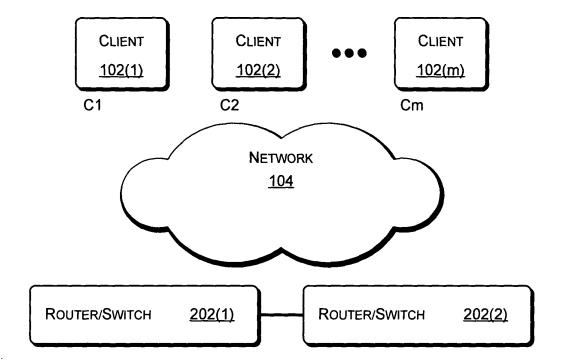
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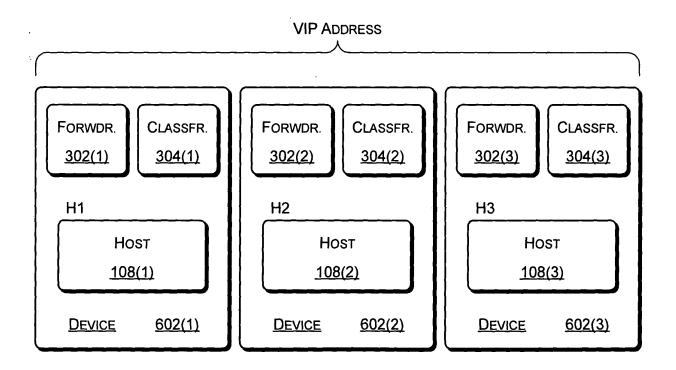
500 ---**OPERATE** 502 **NETWORK LOAD BALANCING INFRASTRUCTURE** IN A FIRST CONFIGURATION 504 SCALE OUT **NETWORK LOAD BALANCING INFRASTRUCTURE OPERATE SCALED-OUT** 506 **NETWORK LOAD BALANCING INFRASTRUCTURE** IN A **SECOND CONFIGURATION** 

Docket No: MS1-1517US 6 of 40 Inventor(s): Gbadegesin et al. Title: Network Load Balancing

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with Connection Manipulation



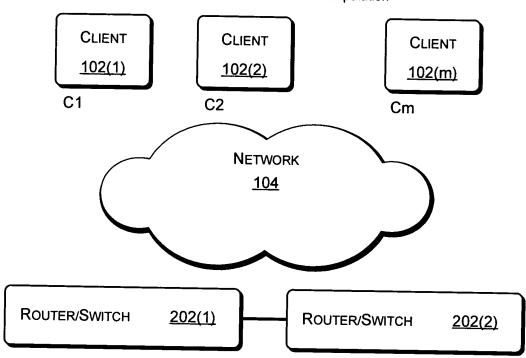


Docket No: MS1-1517US 7 of 40

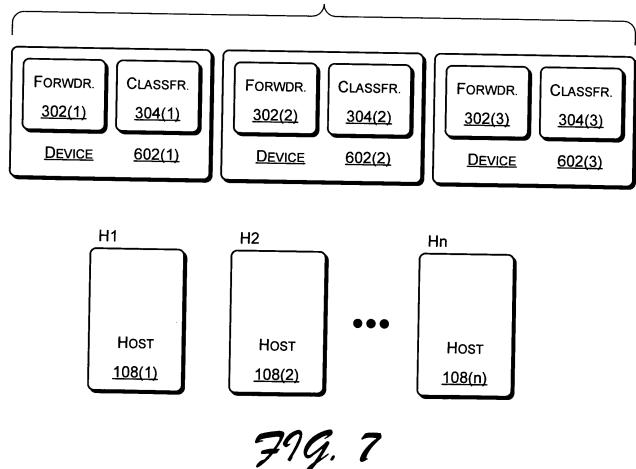
Inventor(s): Gbadegesin et al.

Title: Network Load Balancing
with Connection Manipulation

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## **VIP ADDRESS**

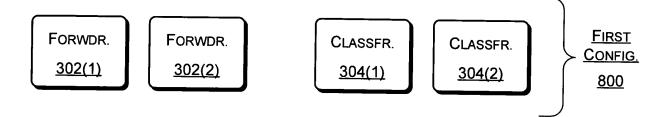


Docket No: MS1-1517US 8 of 40

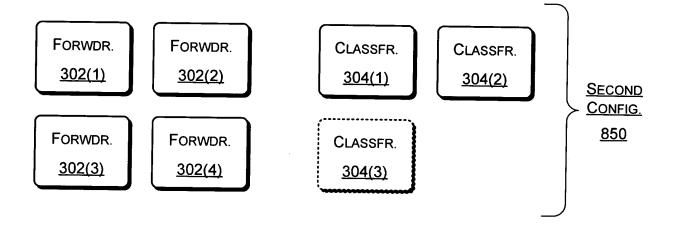
Inventor(s): Gbadegesin et al.

Title: Network Load Balancing
with Connection Manipulation

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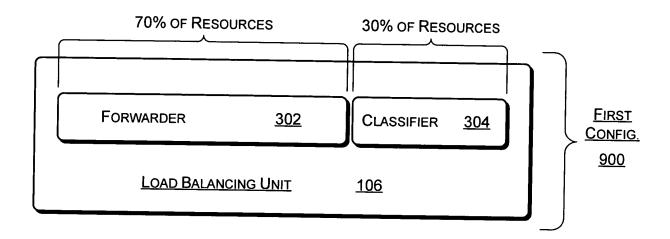
## 77G. 8A



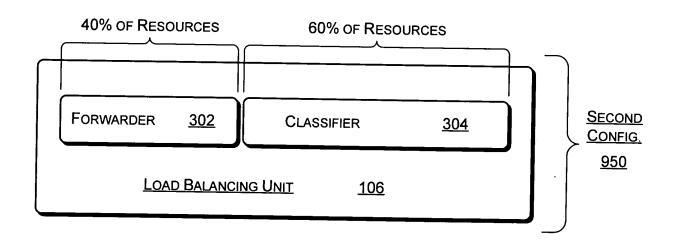
Docket No: MS1-1517US 9 of 40 Inventor(s): Gbadegesin et al. Title: Network Load Balancing

with Connection Manipulation

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## 77G. 9A

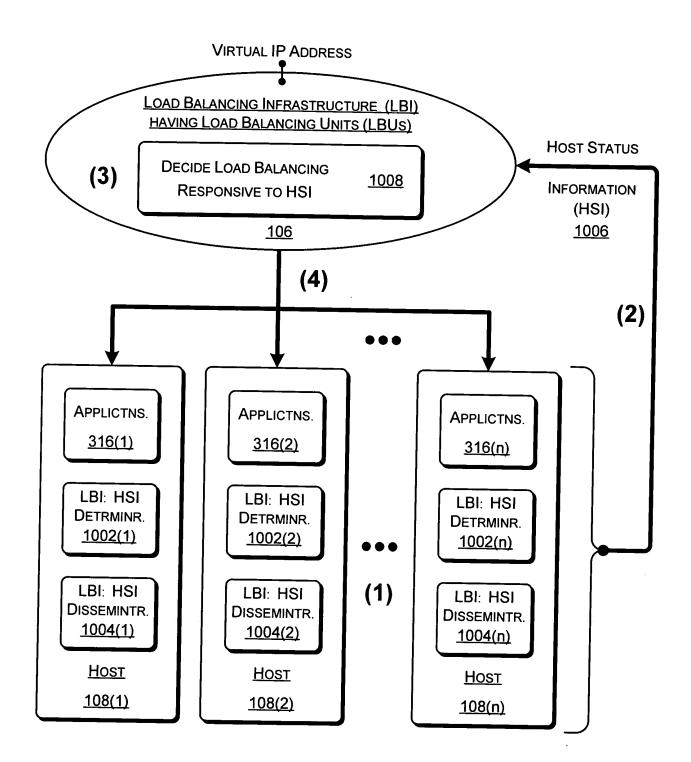


799.98

Docket No: MS1-1517US 10 of 40

Inventor(s): Gbadegesin et al.

Title: Network Load Balancing
with Connection Manipulation

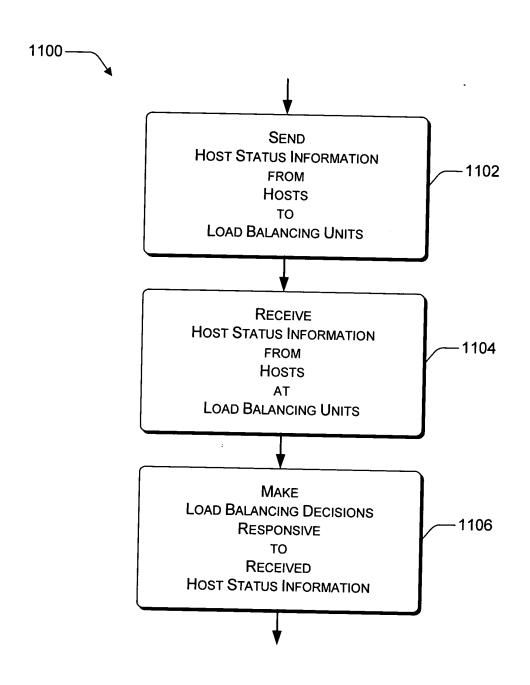


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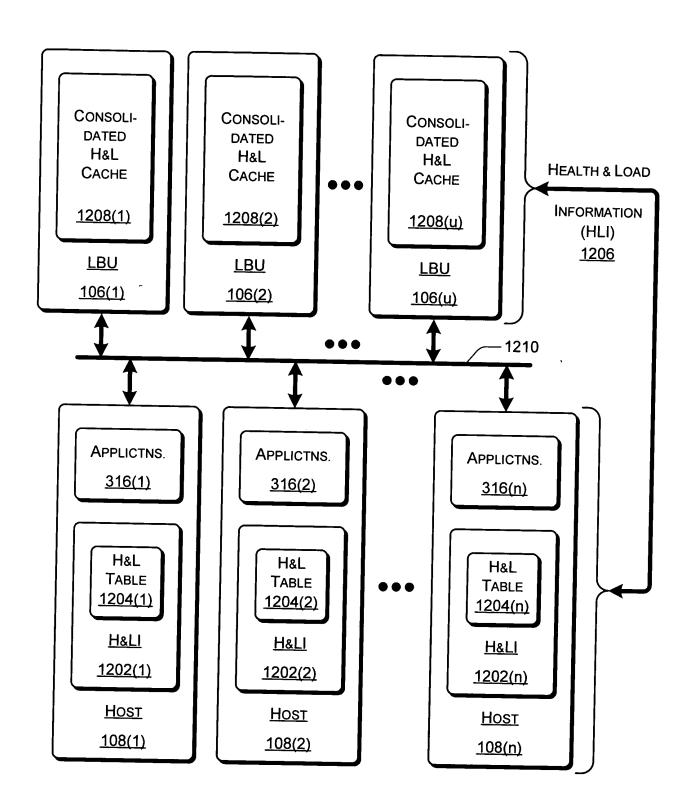
Docket No: MS1-1517US 11 of 40

Inventor(s): Gbadegesin et al.

Title: Network Load Balancing
with Connection Manipulation



799.11



799.12

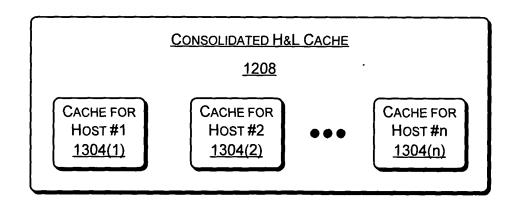
Docket No: MS1-1517US 13 of 40 Inventor(s): Gbadegesin et al.

Title: Network Load Balancing with Connection Manipulation

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H&L ]	1204		
APPLICATION IDENTIFIER (ID)  1302(A)	APPLICATION STATUS CHARACTERIZATION 1302(B)	LOAD BALANCER DIRECTIVE 1302(C)	
VIRTUAL IP ADDR. & PORT	APPLICATION HEALTH	TARGET LOAD BALANCING	
PHYSICAL IP ADDR. & PORT	APPLICATION LOAD	STATE	
PROTOCOL	7 11 1 207 117011 207 12	CURRENT LOAD BALANCING STATE	
PROTOCOL-SPECIFIC INFO.	APPLICATION CAPACITY		

## 799. 13A



71G. 138

Docket No: MS1-1517US 14 of 40 Inventor(s): Gbadegesin et al.

Title: Network Load Balancing with Connection Manipulation

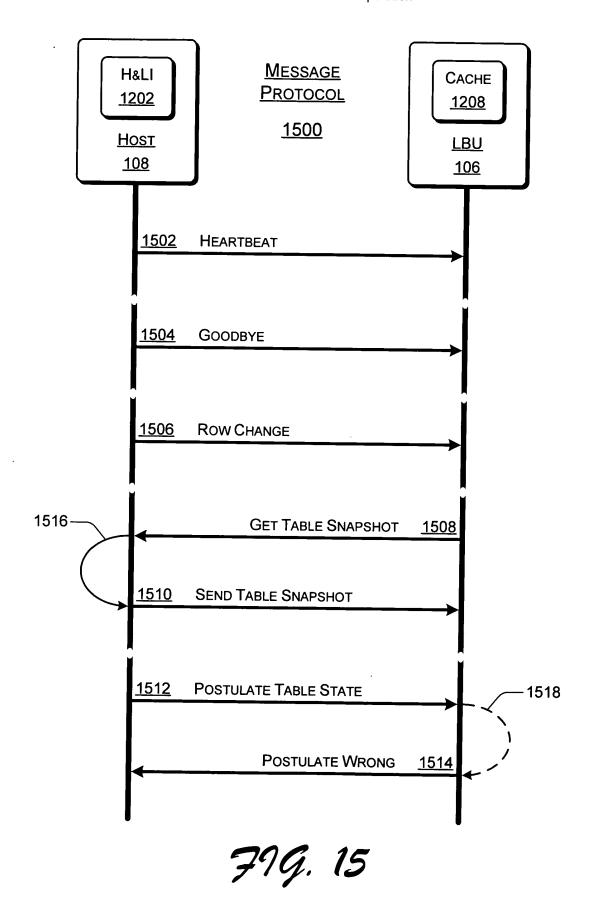
+ -1400 DETERMINE - 1402 HOST **HEALTH & LOAD INFORMATION** -1418 DISSEMINATE 1404 **HEALTH & LOAD INFORMATION** TO LBUS **Host** 108 <u>LBU</u> RECEIVE 1406 106 **HEALTH & LOAD INFORMATION FROM HOSTS** -1420 1408 CACHE **HEALTH & LOAD INFORMATION** -1422 RECEIVE 1410 PACKET REQUESTING **New Connection CONSULT** 1412 CACHED -1416 **HEALTH & LOAD INFORMATION FORWARD** PACKET TO **SELECTED HOST SELECT HOST** 1414 RESPONSIVE TO CACHED **HEALTH & LOAD INFORMATION** 

799.14

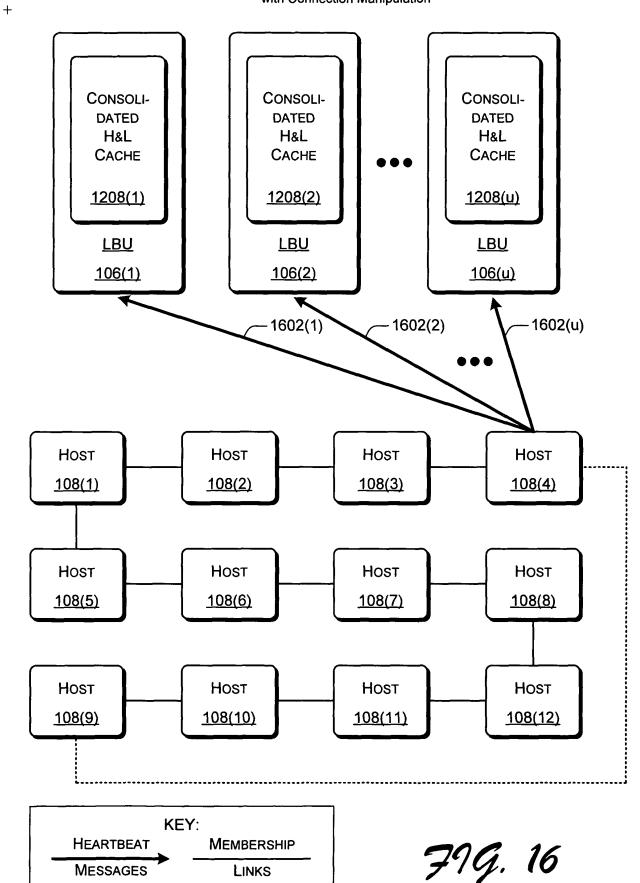
Docket No: MS1-1517US 15 of 40

Inventor(s): Gbadegesin et al.

Title: Network Load Balancing
with Connection Manipulation



Docket No: MS1-1517US 16 of 40



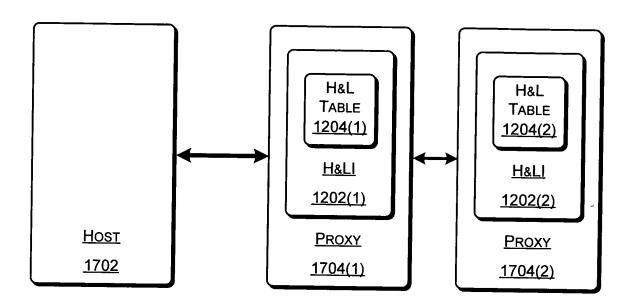
Docket No: MS1-1517US 17 of 40

Inventor(s): Gbadegesin et al.

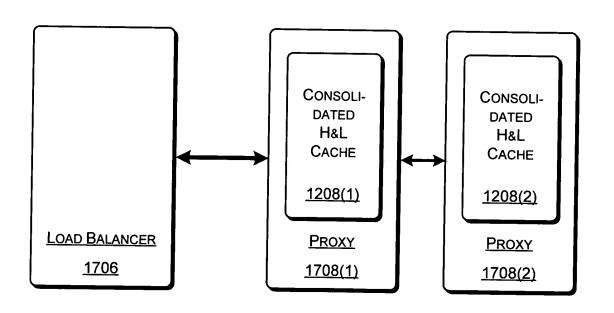
Title: Network Load Balancing
with Connection Manipulation

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79G. 17A



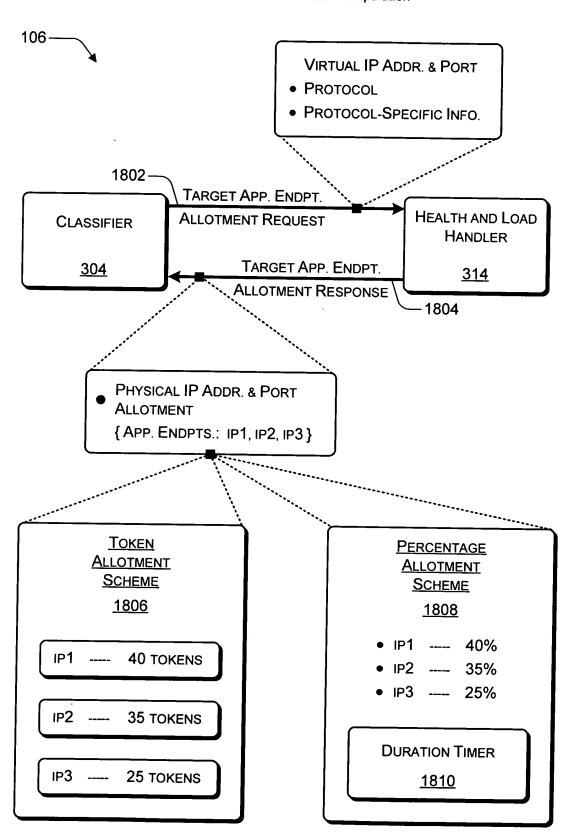
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Docket No: MS1-1517US 18 of 40

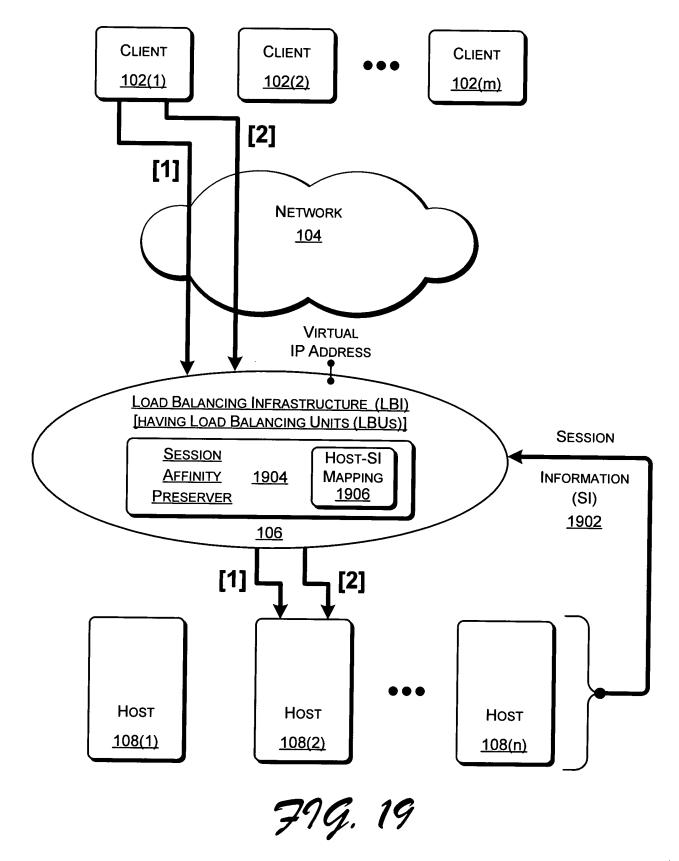
Inventor(s): Gbadegesin et al.

Title: Network Load Balancing
with Connection Manipulation

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77G. 18



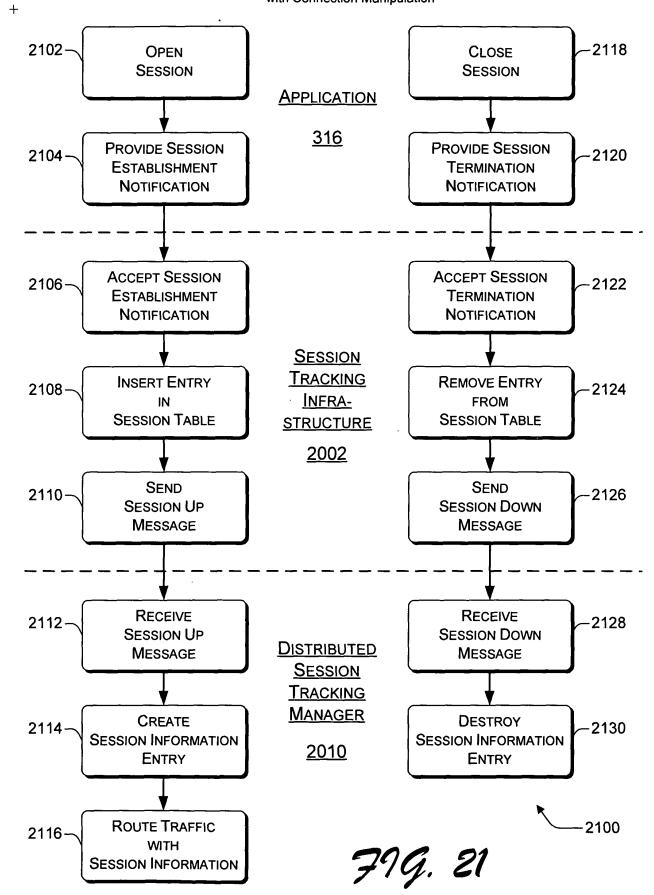
Docket No: MS1-1517US 20 of 40 Inventor(s): Gbadegesin et al.

Title: Network Load Balancing with Connection Manipulation

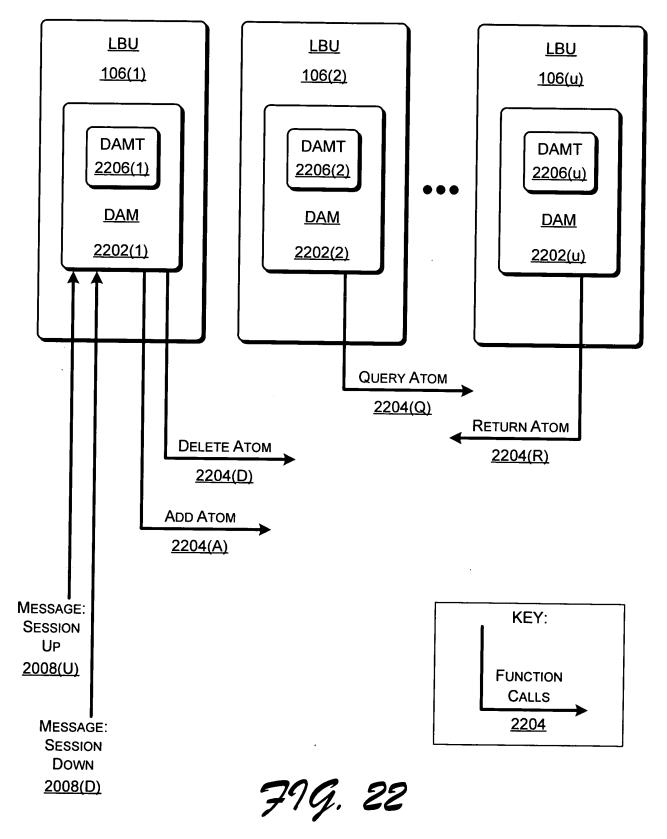
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**LBU LBU LBU** 106(1) 106(2) 106(u) TRAFFIC ROUTING **FUNCTIONALITY TRF TRF** (TRF) 2012(2) 2012(u) 2012(1) **DISTRIBUTED SESSION** <u>2010</u> 2010 <u> 2010</u> TRACKING MANAGER MESSAGE: MESSAGE: **SESSION SESSION** UР Down 2008(U) 2008(D) **SESSION TRACKING INFRASTRUCTURE (STI)** STI STI 2002(1) 2002(2) 2002(n) SESSION TABLE 2014(1) NOTECTN: NOTECTN: <u>API</u> SESSION SESSION 2004 ESTABLD. TERMTD. 2006(E) 2006(T) APPLICATION(S) APPS. APPS. 316(2) 316(1) 316(n) **HOST** <u>Host</u> **HOST** 108(1) 108(2) 108(n)

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2202/1)	SESSION TABLE			20	<u>2014</u>		
2302(1)—		SESSION IDENTIFIER	2302(11)	SESSION TYPE/APPLIC.	2302(1T)		
		SESSION IDENTIFIER	2302(21)	SESSION TYPE/APPLIC.	2302(2T)		
2302(v)—			•				
2002(V)		SESSION IDENTIFIER	2302(vI)	SESSION TYPE/APPLIC.	2302(vT)		

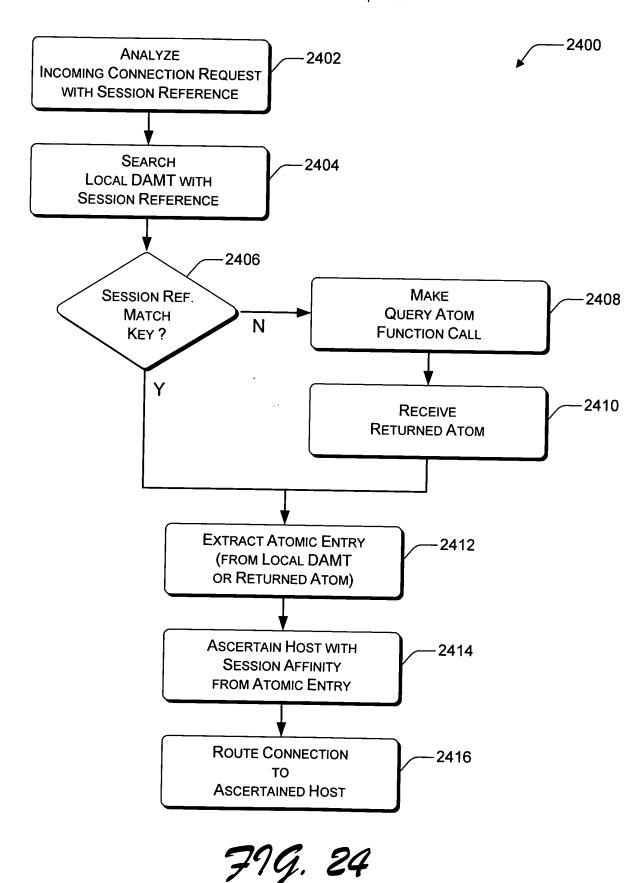
799. 23A

2204(4)	DISTRIBUTED ATOM MANAGER (DAM) TABLE (DAMT) 2206						
2304(1)— 2304(2)—		KEY	2304(1K)	Dата	2304(1D)	METADATA	2304(1M)
2304(2)		KEY	2304(2K)	DATA	2304(2D)	METADATA	2304(2M)
2304(w)—							
2004(W)		KEY	2304(wK)	Dата	2304(wD)	METADATA	2304(wM)

Docket No: MS1-1517US 24 of 40 Inventor(s): Gbadegesin et al. Title: Network Load Balancing

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with Connection Manipulation

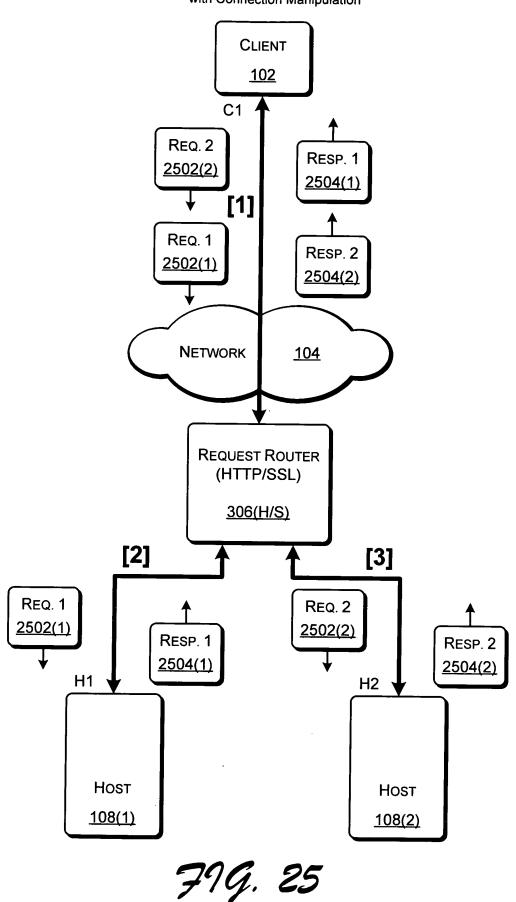


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Inventor(s): Gbadegesin et al.

Title: Network Load Balancing
with Connection Manipulation

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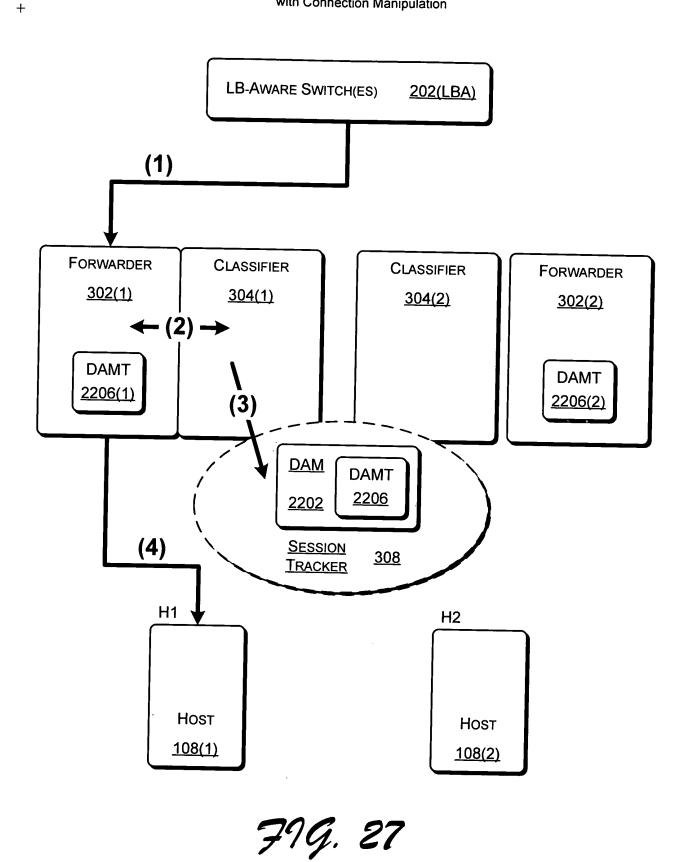
Docket No: MS1-1517US 26 of 40 Inventor(s): Gbadegesin et al.

Title: Network Load Balancing with Connection Manipulation

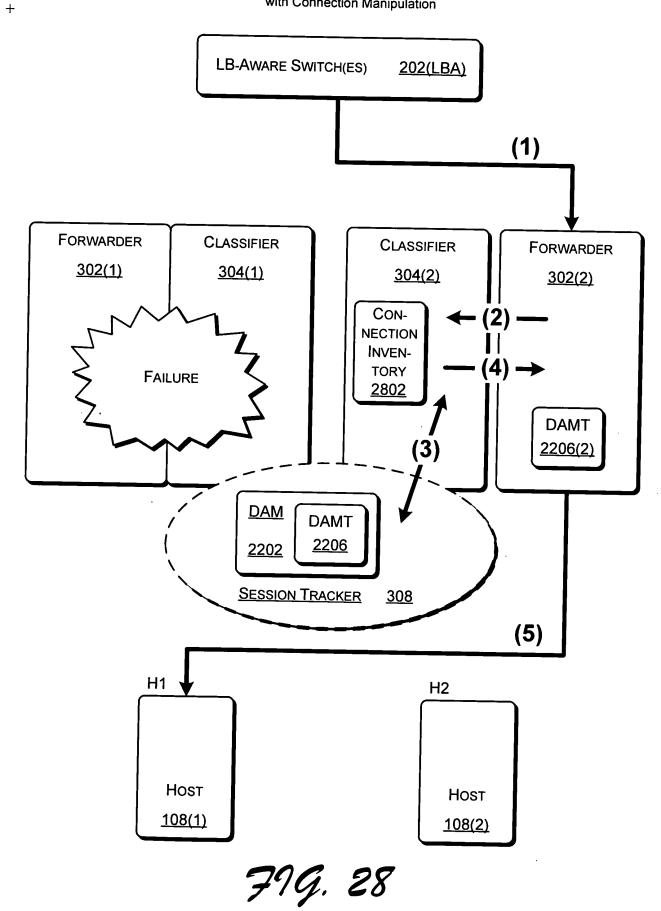
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2600 2602 RECEIVE INCOMING PACKET 2604 PACKET Υ FOR Ν **PREEXISTING SESSION** 2606 ASCERTAIN AFFINITIZED HOST 2612 **SELECT HOST** RESPONSIVE TO 2608 HEALTH AND LOAD INFO. **AFFINITIZED** Ν Host **HEALTHY** 2614 **ROUTE PACKET** TO **SELECTED HOST** 2610 **ROUTE PACKET** 2616 TO **AFFINITIZED HOST** PLUMB ROUTE FOR CONNECTION

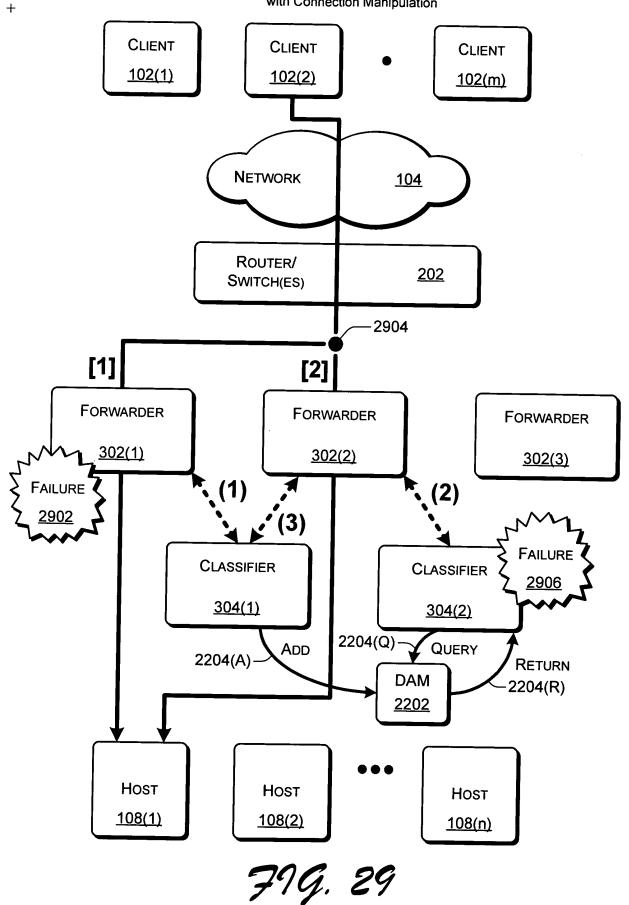
Docket No: MS1-1517US 27 of 40



Docket No: MS1-1517US 28 of 40

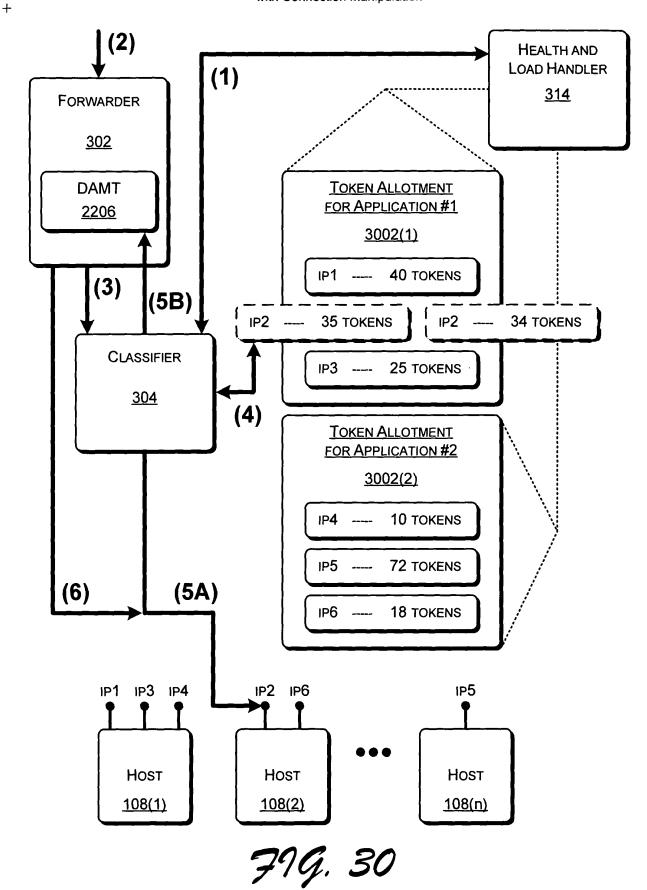


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Docket No: MS1-1517US 30 of 40 Inventor(s): Gbadegesin et al.

Title: Network Load Balancing with Connection Manipulation

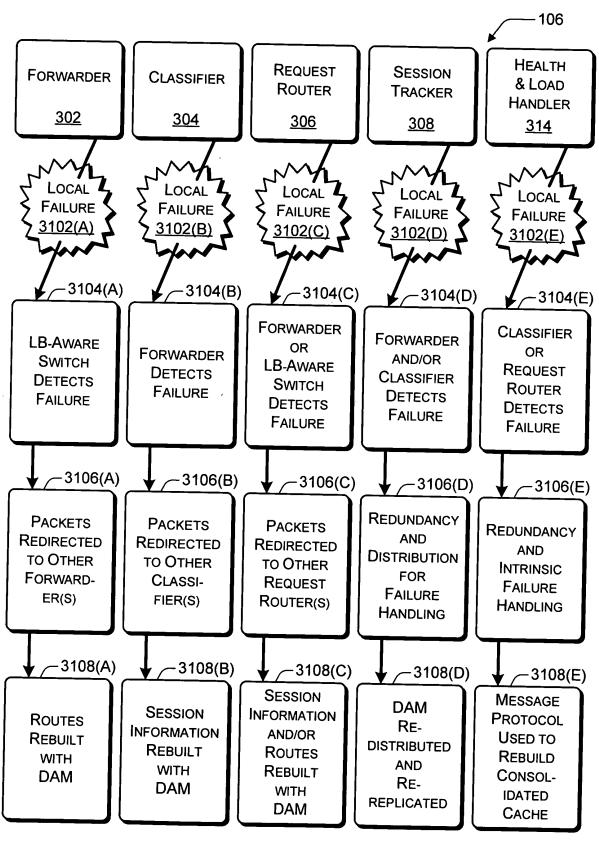


Docket No: MS1-1517US 31 of 40

Inventor(s): Gbadegesin et al.

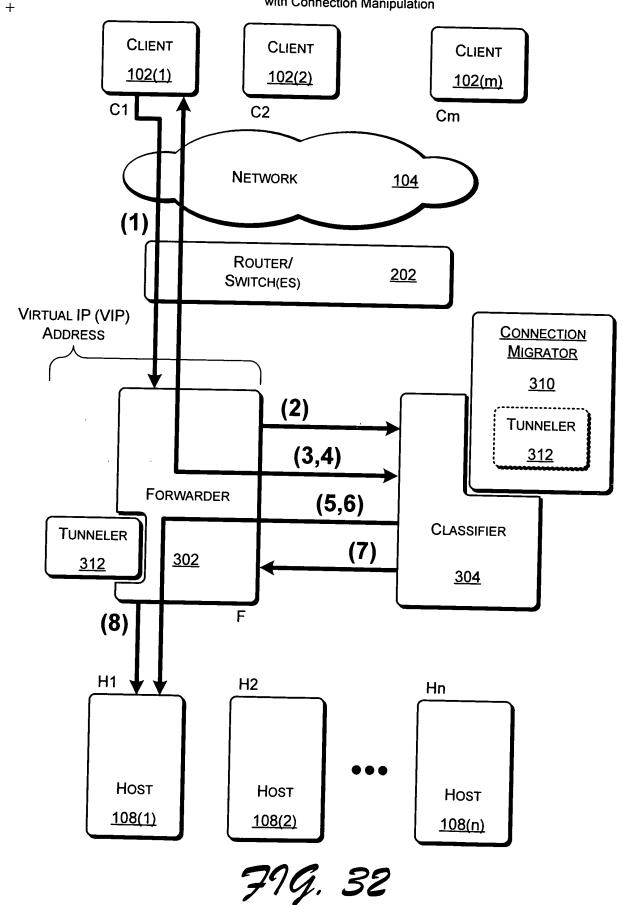
Title: Network Load Balancing
with Connection Manipulation

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Docket No: MS1-1517US 32 of 40 Inventor(s): Gbadegesin et al. Title: Network Load Balancing

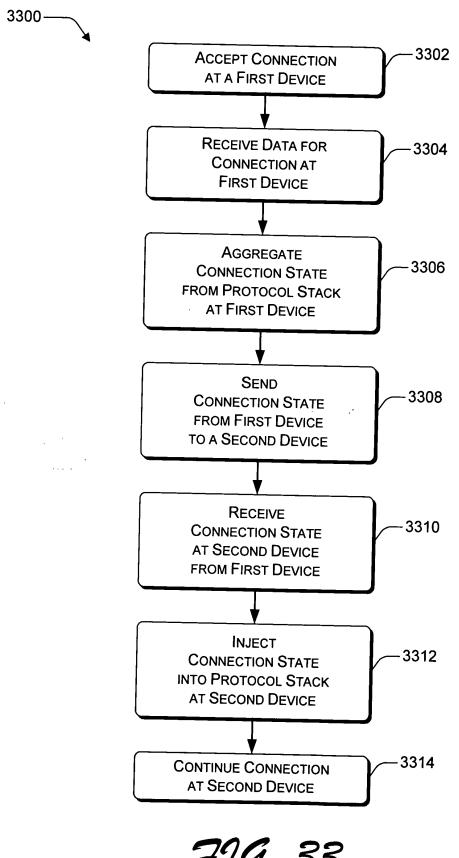
with Connection Manipulation



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Inventor(s): Gbadegesin et al. Title: Network Load Balancing with Connection Manipulation

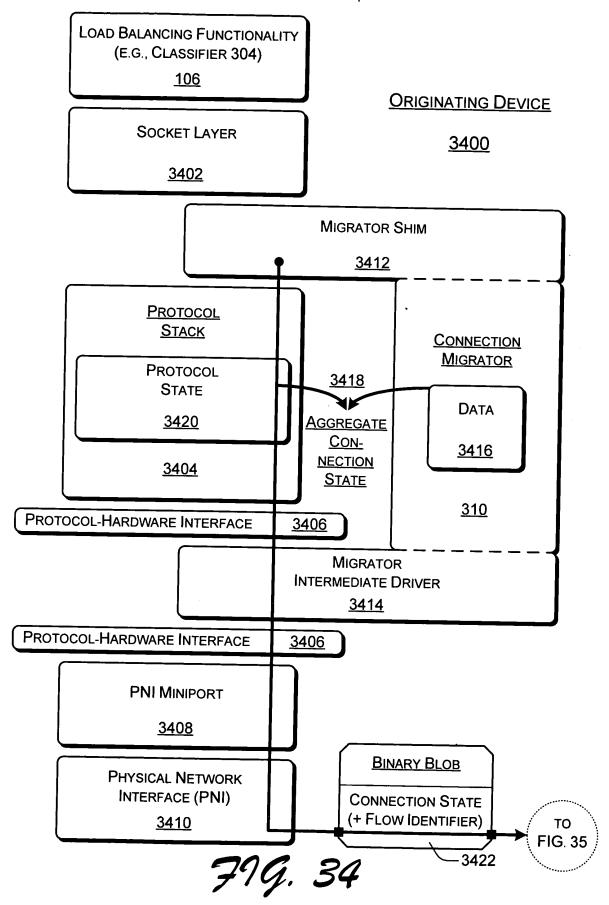
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Docket No: MS1-1517US 34 of 40

Inventor(s): Gbadegesin et al.

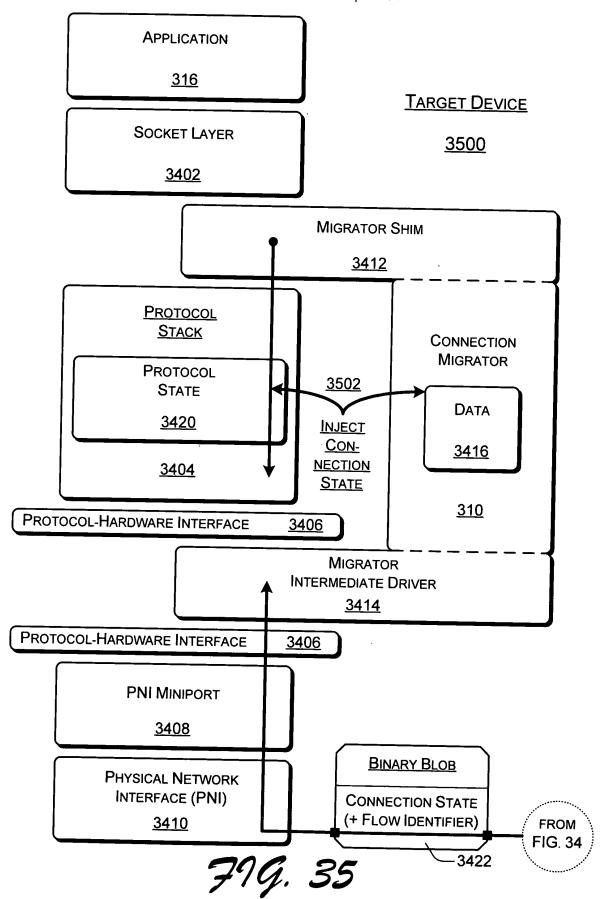
Title: Network Load Balancing
with Connection Manipulation



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Inventor(s): Gbadegesin et al.

Title: Network Load Balancing
with Connection Manipulation



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Inventor(s): Gbadegesin et al.
Title: Network Load Balancing
with Connection Manipulation

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**MIGRATION OFFLOADING PROCEDURE** SOCKET LAYER 3600 <u>3402</u> MIGRATOR SHIM <u>3412</u> <6> <3> 3404(T) **TCP** CONNECTION MIGRATOR IP 3404(I) 3404(A) **ARP** <4> <5> PROTOCOL-HARDWARE **INTERFACE** 3406 <u>310</u> **MIGRATOR** <1> INTERMEDIATE DRIVER <u>3414</u> PROTOCOL-HARDWARE INTERFACE <u>3406</u> **PNI MINIPORT** <u>3408</u>

79G. 36

Docket No: MS1-1517US 37 of 40 Inventor(s): Gbadegesin et al.

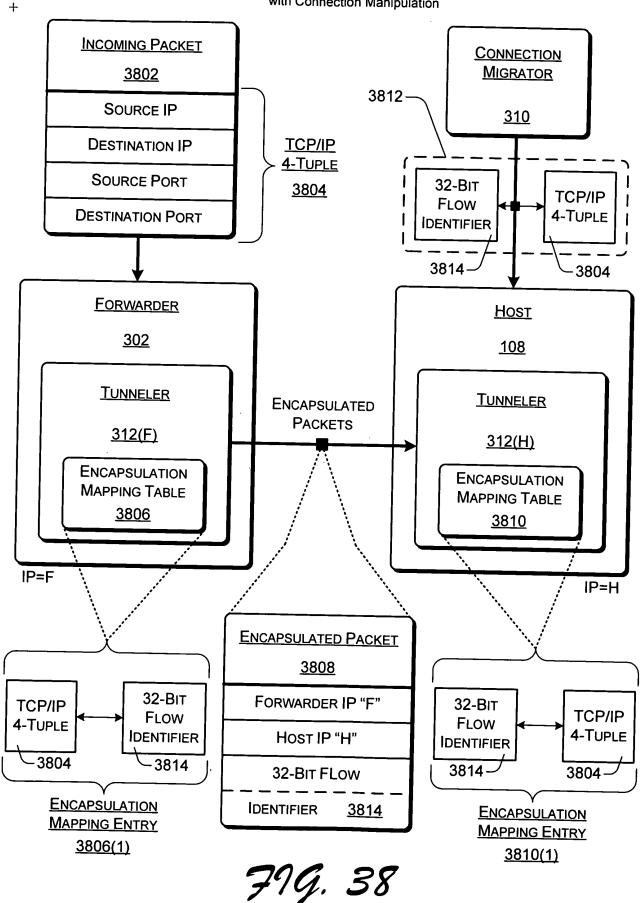
Title: Network Load Balancing with Connection Manipulation

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**MIGRATION UPLOADING PROCEDURE** SOCKET LAYER 3700 3402 <6> <4> MIGRATOR SHIM <u>3412</u> <8> **TCP** 3404(T) CONNECTION **MIGRATOR** IΡ 3404(I) 3404(A) **ARP** <5> PROTOCOL-HARDWARE **INTERFACE** <u>3406</u> <u>310</u> **MIGRATOR** <1>< INTERMEDIATE DRIVER <u>3414</u> PROTOCOL-HARDWARE **INTERFACE** <u>3406</u> <2> **PNI MINIPORT** <u>3408</u>

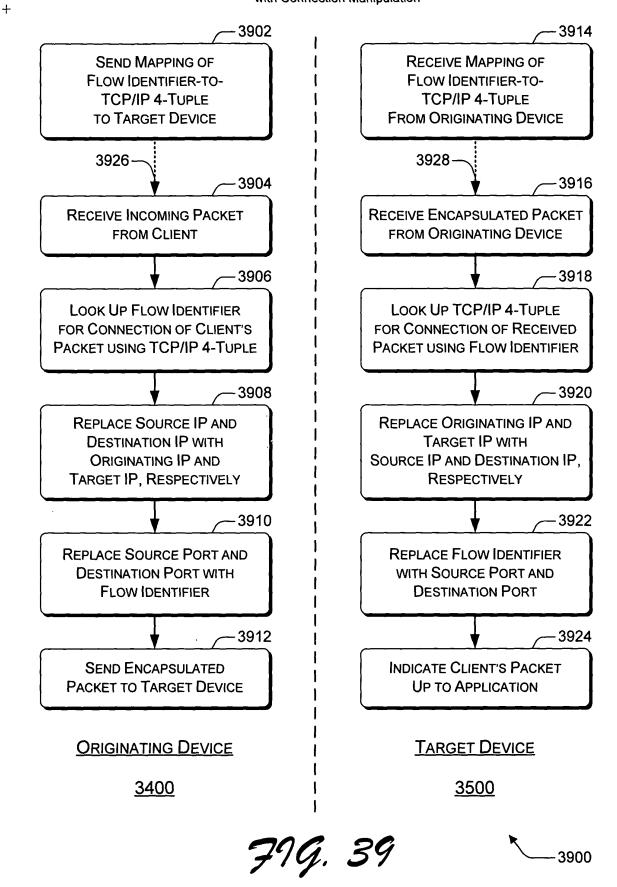
71G. 37

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Title: Network Load Balancing with Connection Manipulation



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